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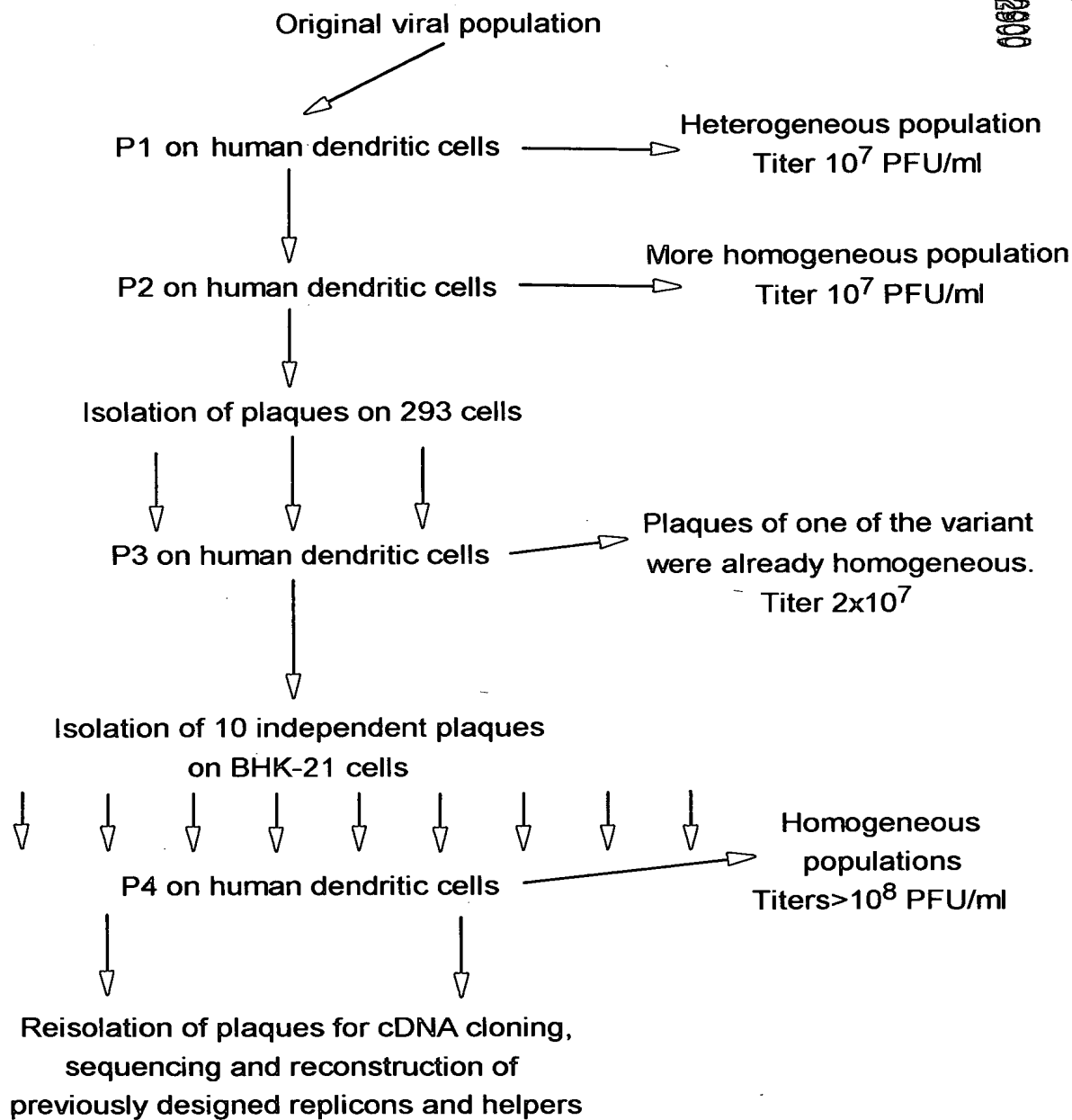
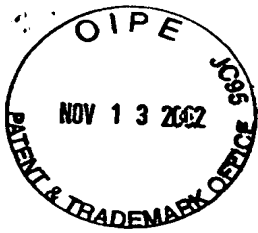
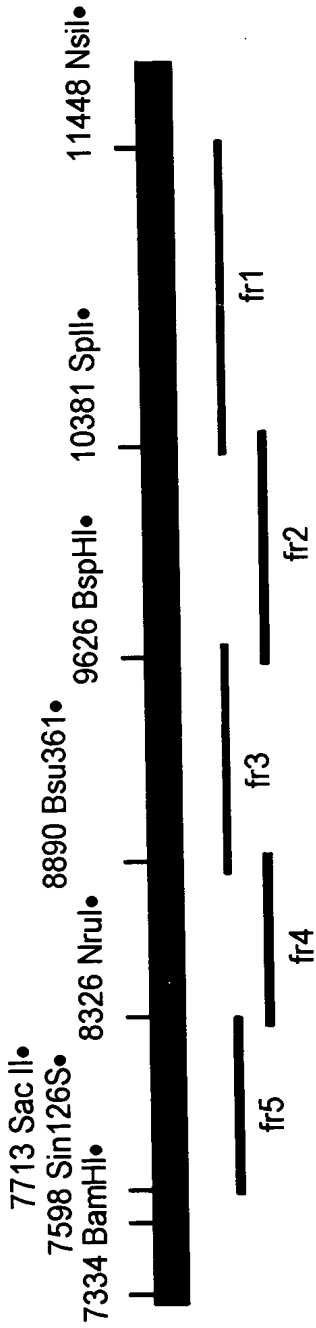


FIG. 1



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A)



B)

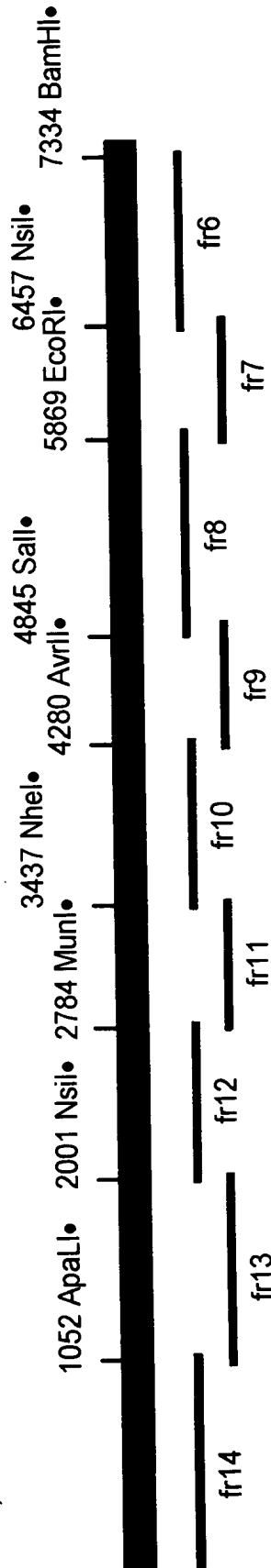


FIG. 2A

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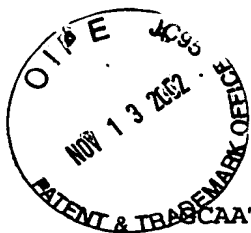
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ATTGACGGCGTAGTACACACTATTGAATCAAACAGCCGACCAATTGCACTACCATCACAATGGAGAAGCCAGTAG
TAAACGTAGACGTAGACCCCCAGAGTCCGTTTGTCTGTGCAACTGCAAAAAGCTTCCCGCAATTTGAGGTAGTAG
CACAGCAGGTCACTCAAATGACCATGCTAATGCCAGAGCATTTTCGCATCTGGCCAGTAACTAATCGAGCTGG
AGGTTCTTACCACAGCGACGATCTTGGACATAGGCAGCGCACCGGCTCGTAGAATGTTTTCCGAGCACCAGTATC
ATTGTGTCTGCCCCATGCGTAGTCCAGAAGACCCGGACCGCATGATGAAATATGCCAGTAACTGGCGGAAAAAG
CGTGCAAGATTACAAACAAGAACTTGCATGAGAAGATTAAGGATCTCCGGACCGTACTTGATACGCCGGATGCTG
AAACACCATCGCTCTGCTTTCACAACGATGTTACCTGCAACATGCGTGCCGAATATTCCGTCAATCGAGACGTGT
ATATCAACGCTCCCGAACTATCTATCATCAGGCTATGAAAGCGTGCGGACCCTGTACTGGATTGGCTTCGACA
CCACCCAGTTTCTCGGCTATGCGAGGTTCTGACCTGCGTACCAACACCAACTGGGCGGACGAGAAAGTCC
TTGAAGCGCGTAACATCGGACTTTGACGACAAAGCTGAGTGAAGGTAGGACAGGAAAATTGTGATAATGAGGA
AGAAGGAGTTGAAGCCCGGGTTCGCGGTTTATTTCTCCGTAGGATCGACACTTTATCCAGAACACAGAGCCAGCT
TGCAGAGCTGGCATCTTCCATCGGTGTTCCACTTGAATGGAAAGCAGTCGTACACTTGCCGCTGTGATACAGTGG
TGAGTTGCGAAGGCTACGTAGTGAAGAAAATCACCATCAGTCCCGGGATCACGGGAGAAACCGTGGGATACGCGG
TTACACACAATAGCGAGGGCTTCTTGCTATGCAAAGTTACTGACACAGTAAAAGGAGAACGGGTATCGTTCCCTG
TGTGCACGTACATCCCGGCCACCATATGCGATCAGATGACTGGTATAATGGCCACGGATATATCACCTGACGATG
CACAAAACCTTCTGGTTGGGCTCAACCAGCGAATTGTCTATTAACGGTAGGACTAACAGGAACACCAACACCATGC
AAAATTACCTTCTGCCGATCATAGCACAAAGGTTTCAGCAAATGGGCTAAGGAGCGCAAGGATGATCTTGATAACG
AGAAAATGCTGGGTACTAGAGAACGCAAGCTTACGTACGGCTGCTTGTGGGCGTTTCGCACTAAGAAAGTACATT
CGTTTATCGCCACCTGGAACGCAGACCATCGTAAAAGTCCCAGCCTCTTTAGCGCTTTTCCATGTGCTCGG
TATGGACGACCTCTTTGCCCATGTGCTGAGGCGAAATGAACTGGCATTGCAACCAAGAAGGAGGAAAAAC
TGCTGCAGGTCTCGGAGGAATTAGTCATGGAGGCCAAGGCTGCTTTTGAGGATGCTCAGGAGGAAGCCAGAGCGG
AGAAGCTCCGAGAAGCACTTCCACCATTAGTGCGACAGCAAAGGCATCGAGGCAGCCGAGAAAGTTGTCTGCGAAG
TGGAGGGGCTCCAGGCGGACATCGGAGCAGCATTAGTTGAAACCCCGCGCGGTACGTAAGGATAATACCTCAAG
CAAATGACCGTATGATCGGACAGTATATCGTTGTCTCGCCAAACTCTGTGCTGAAGAATGCCAACTCGCACCAG
CGCACCCGCTAGCAGATCAGGTAAAGATCATAACACACTCCGGAAGATCAGGAAGGTACGCGGTGCAACCATACG
ACGCTAAAGTACTGATGCCAGCAGGAGGTGCCGTACCATGGCCAGAATTCTAGCACTGAGTGAGAGCGCCACGT
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GCGTTAAGAAGGAAGAAGCCTCAGGTCTGTTCTCTCGGGAGAACTGACCAACCCTCCCTATCATGAGCTAGCTC
TGGAGGGACTGAAGACCCGACCTGCGGTCCCGTACAAGGTGCAAAACAATAGGAGTGATAGGCACACCGGGGTGCG
GCAAGTCAGCTATTATCAAGTCAACTGTACGGCAGCAGATCTTGTTACCAGCGGAAAGAAAGAAAATTGTGCGG
AAATTGAGGCGGACGTGCTAAGACTGAGGGGTATGCAGATTACGTGCAAGACAGTAGATTGCGTTATGCTCAACG
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TTGCTATCGTCAGGCCCCGCAAGAAGGTAGTACTATGCGGAGACCCCATGCAATGCGGATTCTTCAACATGATGC
AACTAAAGGTACATTTCAATCACCTGAAAAAGACATATGCACCAAGACATTCTACAAGTATATCTCCCGGCGTT
GCACACAGCCAGTTACAGCTATTGTATCGACACTGCATTACGATGGAAGATGAAAACCAAGAACCCGTGCAAGA
AGAACATTGAAATCGATATTACAGGGGCCACAAAGCCGAAGCCAGGGGATATCATCCTGACATGTTTCCGCGGGT
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TGCTCACCCGCACTGAGGACAGGCTAGTGTGGAAAACCTTGCAAGGCGACCCATGGATTAAGCAGCTCACTAACA
TACCTAAAGGAACTTTTCAAGGCTACTATAGAGGACTGGGAAGCTGAACACAAGGGAATAATTGCTGCAATAAACA
GCCCCACTCCCCGTGCCAATCCGTTTCACTGCAAGACCAACGTTTGTGTTGGGCGAAAGCATTGGAACCGATACTAG
CCACGGCCGGTATCGTACTTACCGGTTGCCAGTGGAGCGAACTGTTCCACAGTTTGGCGATGACAAACCACTT
CGGCCATTTACGCCTTAGACGTAATTTGCAATTAACTTTTTCGGCATGGACTTGACAAGCGGACTGTTTTCTAAAC
AGAGCATCCCATAACGTACCATCCCGCGATTACGCGAGGCGGCTAGCTCATTGGGACAAACAGCCAGGAACCC
GCAAGTATGGGTACGATCACGCCATTGCGCGCAACTCTCCCGTAGATTTCCGGTGTTCAGCTAGCTGGGAAGG
GCACACAACCTTGATTTGCAGACGGGGAGAACAGAGTTATCTCTGCACAGCATAACCTGGTCCCGGTGAACCGCA
ATCTTCTCAGCGCTTAGTCCCCGAGTACAAGGAGAAGCAACCCGGCCCGGTGCAAAAATTCTTGAACAGTTCA
AACACCACTCAGTACTTGTGGTATCAGAGGAAAAAATTGAAGCTCCCGTAAGAGAATCGAATGGATCGCCCCGA
TTGGCATAGCCGGTGCAGATAAGAACTACAACCTGGCTTTTCGGGTTTCCGCCGAGGCACGGTACGACCTGGTGT
TCATCAACATTGGAATAAATAACAGAAACCACTTTTTCAGCAGTGCAGAACCATGCGGCGACCTTAAAAACCC
TTTCGCGTTCCGGCCCTGAATTGCCTTAACCCAGGAGGCACCTTCGTGGTGAAGTCTATGGCTACGCCGACCGCA
ACAGTGAGGACGTAGTCACCGCTCTTGCCAGAAAGTTTGTGAGGGTGTCTGCAGCGAGACCAGATTGTGTCTCAA

FIG. 2B-1



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CAATACAGAAATGTACCTGATTTTCCGACAAC TAGACAACAGCCGTACACGGCAATTACCCCGCACCATCTGA
ATTGCGTGATTTTCGTCCGTGTATGAGGGTACAAGAGATGGAGTTGGAGCCGCGCCGTATACCCGACCAAAAGGG
AGAATATTGCTGACTGTCAAGAGGAAGCAGTTGTCAACGCAGCCAATCCGCTGGGTAGACCAGGCGAAGGAGTCT
GCCGTGCCATCTATAAACGTTGGCCGACCAGTTTACCGATTACGCCACGGGAGACAGGCACCGCAAGAATGACTG
TGTGCCTAGGAAAAGAGTGATCCACGCGGTTCGGCCCTGATTTCCGGAAGCACCCAGAAGCAGAAGCCTTGAAAT
TGCTACAAAACGCCTACCATGCAGTGGCAGACTTAGTAAATGAACATAACATCAAGTCTGTGCCATTCCACTGC
TATCTACAGGCATTTACGCAGCCGAAAAGACCGCCTTGAAGTATCACTTAAGTCTTGACAACCGCGCTAGACA
GAACTGACGCGGACGTAACCATCTATTGCCTGGATAAGAAGTGAAGGAAAGAATCGACGCGGCACTCCAACCTA
AGGAGTCTGTAACAGAGCTGAAGGATGAAGATATGGAGATCGACGATGAGTTAGTATGGATCCATCCAGACAGTT
GCTTGAAGGGAAGAAAGGGATTAGTACTACAAAAGGAAAATTGTATTTCGTACTTCGAAGGCACCAAATTCATC
AAGCAGCAAAAGACATGGCGGAGATAAAGGTCCTGTTCCCTAATGACCAGGAAAGTAATGAACAACCTGTGTGCCT
ACATATTGGGTGAGACCATGGAAGCAATCCGCGAAAAGTGCCCGGTGACCATAAACCCGTCTGTCTAGCCCGCCCA
AAACGTTGCCGTGCCCTTTGCATGTATGCCATGACGCCAGAAAGGTTCCACAGACTTAGAAGCAATAACGTCAAAG
AAGTTACAGTATGCTCCTCCACCCCCCTTCTAAGCAAAAATTAAGAATGTTCAGAAGGTTAGTGACGAGAAAG
TAGTCTGTGTTAATCCGCACACTCCCGCATTGTTCCCGCCGTAAGTACATAGAAGTGCCAGAACACGCTACCG
TCTCTCTGCACAGGCGAGGAGGCCCGCAAGTTGTAGCGACACCGTCACCATCTACAGCTGATAACACCTCGC
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CAGCGGCTAGAAAAGAGCCCACTCCACCGCAAGCAATAGCTCTGAGTCCCTCCACCTCTCTTTTGGTGGGTAT
CCATGTCCCTCGGATCAATTTTCGACGGAGAGACGGCCCGCCAGGCAGCGGTACAACCCCTGGCAACAGGCCCCA
CGGATGTGCCTATGTCTTTTCGGATCGTTTTCCGACGGAGAGATTGATGAGCTGAGCCGAGAGTAACCTGAGTCCG
AACCCGTCTGTGTTGGATCATTGTAACCGGGCGAAGTGAACCTCAATTATATCGTCCCGATCAGCCGTATCTTTTC
CACTACGCAAGCAGAGACGTAGACGCAGGAGCAGGAGGACTGAATACTGACTAACCGGGGTAGGTGGGTACATAT
TTTCGACGGACACAGGCCCTGGGCACTTGCAAAAGAAGTCCGTTCTGCAGAACCAGCTTACAGAACCGACCTTGG
AGCGCAATGTCTTGGAAGAATTCATGCCCGGTGCTCGACACGTCGAAAGAGGAACAACCTCAAACCTCAGGTACC
AGATAGTGCCCAACGAGCAACAAGTAGGTACCACTCTCGTAAAGTAGAAAATCAGAAAGCCATAACCACTG
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AACCATTGTATCTCAGTAGCGTACCGGCAACTACTCCGATCCACAGTTCTGCTGTAGCTGTCTGTAACAACCTATC
TGCATGAGAACTATCCGACAGTAGCATCTTATCAGATTACTGACGAGTACGATGCTTACTTGGATATGGTAGACG
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GAAAATATGCATGTAATGACGAGTATGAGGAGGAGTTGCTCGGAAGCCAATTAGGATTACCACTGAGTTTGTCA
CCGCATATGTAGCTAGACTGAAAGGCCCTAAGGCCGCCCACTATTGCAAGACGTATAATTGGTCCCATTGC
AAGAAGTGCTATGGATAGATTTCGTATGGACATGAAAAGGGACGTGAAAGTTACACCAGGCACGAAACACACAG
AAGAAAGACCGAAAGTACAAGTGATACAAGCCGAGAACCCCTGGCGACTGCTTACTTATGCGGGATTACCCGGG
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AAGACGACGCTATGGCGTTAACCGGTCTGATGATCTTGGAGGACCTGGGTGTGGATCAACCACTACTCGACTTGA
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GGCTTAAAACGTCCAGATGTGCAGCGTTTATTGGCGACGACAACATCATACATGGAGTAGTATCTGACAAAAGAA
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agcatctctacgggtggtcctaaatagtacgcatagtacatttcatctgactaataactacaacaccaccacatga
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AGCAACCACCGAAGCCGAAGAAACCAAAACGCAGGAGAAGAAGAAGCAACCTGCAAAACCCAAACCCGGAA
AGAGACAGCGCATGGCACTTAAGTTGGAGGCCGACAGATCGTTTCGACGTCAAGAACGAGGACGGAGATGTCATCG
GGCAGCACTGGCCATGGAAGGAAAGGTAATGAAACCTCTGCACGTGAAAGGAACCATCGACCACCTGTGCTAT
CAAAGCTCAAATTTACCAAGTCGTGAGCATACGACATGGAGTTTCGCACAGTTGCCAGTCAACATGAGAAGTGAGG
CATTACCTACACCAGTGAACACCCCGAAGGATTCTATAACTGGCACCACGAGCGGTGAGTATAGTGGAGGTA
GATTTACCATCCCTCGCGGAGTAGGAGGCAGAGGAGACAGCGGTCTGTCGATCATGGATAACTCCGGTCTGCTG

FIG. 2C-2



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TCGCGATAGTCTCGGTGGAGCTGATGAAGGAACACGAACTGCCCTTTTCGGTTCGTACCTGGAATAGTAAAGGGA
AGACAATTAAGACGACCCCGGAAGGGACAGAAGAGTGGTCCGCAGCACCCTGGTCACGGCAATGTGTTTGCTCG
GAAATGTGAGCTTCCCATGCGACCGCCCGCCACATGCTATACCCGCGAACCTTCCAGAGCCCTCGACATCCTTG
AAGAGAACGTGAACCATGAGGCCTACGATACCCTGCTCAATGCCATATTGCGGTGCGGATCGTCTGGCAGAAGCA
AAAGAAGCGTCACTGACGACTTTACCCTGACCAGCCCCCTACTTGGGCACATGCTCGTACTGCCACCATACTGAAC
CGTGCTTCAGCCCTGTTAAGATCGAGCAGGTCTGGGACGAAGCGGACGATAACACCATAACGCATACAGACTTCCG
CCCAGTTTGGATACGACCAAAGCGGAGCAGCAAGCGCAAACAAGTACCGCTACATGTCGCTTAAGCAGGATCACA
CCGTAAAGAAGGCACCATGGATGACATCAAGATTAGCACCTCAGGACCGGTGTAGAAGGCTTAGCTACAAAGGAT
ACTTCTCCTCGCAAAATGCCCTCCAGGGGACAGCGTAACGGTTAGCATAGTGAGTAGCAACTCAGCAACGTCAT
GTACACTGGCCCGCAAGATAAAACCAAATTCGTGGGACGGGAAAAATATGATCTACCTCCCGTTACGGTAAAA
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ACGCTTATACATCCTACCTGGAAGAATCATCAGGGAAAGTTTACGCAAAGCCGCCATCTGGGAAGAACATTACGT
ATGAGTGCAAGTGCAGGACTACAAGACGAGAACCGTTTCGACCCGACCGAAATCACTGGTTGCACCGCCATCA
AGCAGTGCCTCGCTATAAGAGCGACCAACGAAGTGGGTCTTCAACTCAGGACTTGATCAGACATGACGACC
ACACGGCCCAAGGGAAATTGCATTTGCCTTTCAAGTTGATCCCCGAGTACCTGCATGGTCCCTGTTGCCACGCGC
CGAATGTAATACATGGCTTTAAACACATCAGCCTCCAATTAGATACAGACCCTTGACATTGCTCACCACCAGGA
GACTAGGGGCAAACCCGGAACCAACCTGAATGGATCGTCGGAAAGACGGTCAGAACTTCACCGTCGACCGAG
ATGGCCTGGAATACATATGGGGAAATCATGAGCCAGTGAGGGTCTATGCCCAAGAGTCAGCACCAGGAGACCCTC
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AAACGTTACCGGAGACCATGAGTTACTTGTGGTTCGAACAGTCAGCCGTTCTTCTGGGTCCAGTTGTGCATACCTT
TGGCCGCTTTTCATCGTTCTAATGCGCTGCTGCTCCTGCTGCCTGCTTTTTCAGTGGTTGCCGGCGCCTACCTGG
CGAAGGTAGACGCCTACGAACATGCGACCACTGTTCCAAATGTGCCACAGATACCGTATAAGGCACTTGTTGAA
GGGCAGGGTATGCCCCGCTCAATTTGGAGATCACTGTCTGCTCGGAGGTTTTCCTTCCACCAACCAAGAGT
ACATTACCTGCAAAATTCACCACTGTGGTCCCCTCCCCAAAATCAAATGCTGCGGCTCCTTGGAAATGTGAGCCG
CCGTTTCATGAGACTATACCTGCAAGGTCTTCGGAGGGGTCTACCCCTTTATGTGGGGAGGAGCGCAATGTTTTT
GCGACAGTGAGAACAGCCAGATGAGTGAGGCGTACGTGCAACTGTGAGCAGATTGCGCGTCTGACCACGCGCAGG
CGATTAAGGTGCACACTGCCGCGATGAAAGTAGGACTGCGTATAGTGACGGGAACACTACCAGTTTCTAGATG
TGTACGTGAACGGAGTCACACCAGGAACGTCTAAAGACTTGAAAGTCATAGCTGGACCAATTTGAGCATCGTTTA
CGCCATTGATCATAAGGTGTTATCCATCGCGGCTGGTGTACAACTATGACTTCCCGGAATATGGAGCGATGA
AACCAGGAGCGTTTGGAGACATTCAAGCTACCTCCTTGACTAGCAAGGATCTCATCGCCAGCACAGACATTAGGC
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TATCCGACCGCGAAGGTCAATGCCCCGTACATTGCAATTCGAGCAGCAACTCTCCAAGAGTCGACAGTACATG
TCCTGGAGAAAGGAGCGGTGACAGTACACTTTAGCACCGCGAGTCCACAGGCGAACTTTATCGTATCGCTGTGTG
GGAAGAAGACAACATGCAATGCAGAATGTAAACCACAGCTGACCATATCGTGAGCACCCCGCACAAAATGACC
AAGAATTTCAAGCCGCCATCTCAAAAACATCATGGAGTTGGCTGTTTGCCTTTTCGGCGGGCGCCTCGTCGCTAT
TAATTATAGGACTTATGATTTTTGCTTGAGCATGATGCTGACTAGCACACGAAGATGACCGCTACGCCCCAATG
ATCCGACCAGCAAACTCGATGTACTTCCGAGGAACCTGATGTGCATAATGCATcaggctggtacattagatcccc
gcttaccgcgggcaatatagcaacactaaaaactcgatgtacttccgaggaagcgagtgacataatgctgcgag
tggtgccaataaccactatattaaccatttatctagcggagcgcaaaaactcaatgtatttctgaggaagcggtg
gtgcataatgccacgcagcgtctgcataacttttattatttcttttattaatcaacaaaattttgtttttaacat
ttc

FIG. 2B-3



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ATTGACGGCGTAGTACACACTATTGAATCAAACAGCCGACCAATTGCACTACCATCACAAATGGAGAAGCCAGTAG
TAAACGTAGACGTAGACCCCCAGAGTCCGTTTGTCTGCAACTGCAAAAAAGCTTCCCGCAATTTGAGGTAGTAG
CACAGCAGGTCACCTCCAAATGACCATGCTAATGCCAGAGCATTTTCGCATCTGGCCAGTAACTAATCGAGCTGG
AGGTTCTACCACAGCGACGATCTTGGACATAGGCAGCGCACCGGCTCGTAGAATGTTTCCGAGCACCAGTATC
ATTGTGTCTGCCCCATGCGTAGTCCAGAAGACCCGGACCGCATGATGAAATATGCCAGTAACTGGCGGAAAAAG
CGTGCAAGATTACAAACAAGAÄCTTGCATGAGAAGATTAAGGATCTCCGGACCGTACTTGATACGCCGGGATGCTG
AAACACCATCGCTCTGCTTTCACAACGATGTTACCTGCAACATGCGTGCCGAATATTCCGTCTATGCAGGACGTGT
ATATCAACGCTCCCGGAACTATCTATCATCAGGCTATGAAAGGCGTGCGGACCCTGTACTGGATTGGCTTCGACA
CCACCCAGTTTCATGTTCTCGGCTATGGCAGGTTCTGACCTGCGTACAACACCAACTGGGCGGACGAGAAAGTCC
TTGAAGCGCGTAACATCGGACTTTGCAGCACAAAGCTGAGTGAAGGTAGGACAGGAAAATTTGTGATAATGAGGA
AGAAGGAGTTGAAGCCCGGGTTCGCGGGTTATTTCTCCGTAGGATCGACACTTTATCCAGAACACAGAGCCAGCT
TGCAGAGCTGGCATCTTCCATCGGTGTTCCACTTGAATGGAAAGCAGTCGTACACTTGCCGCTGTGATACAGTGG
TGAGTTGCGAAGGCTACGTAGTGAAGAAAATCACCATCAGTCCCGGGATCACGGGAGAAACCGTGGGATACGCGG
TTACACACAATAGCGAGGGCTTCTTGCTATGCAAAGTTACTGACACAGTAAAAGGAGAACCGGTATCGTTCCCTG
TGTGCACGTACATCCCGGCCACCATATGCGATCAGATGACTGGTATAATGGCCACGGATATATCACCTGACGATG
CACAAAACTTCTGGTTGGGCTCAACCAGCGAATTGTCTATTAACGGTAGGACTAACAGGAACCAACACCATTGC
AAAATTACCTTCTGCCGATCATAGCACAGGGTTGACGAAATGGGCTAAGGAGCGCAAGGATGATCTTGATAACG
AGAAAATGCTGGGTACTAGAGAACGCAAGCTTACGTACGGCTGCTTGTGGGCGTTTCGCACTAAGAAAGTACATT
CGTTTTATCGCCACCTTGGAAACGACAGCCATCGTAAAAGTCCAGCCTCTTTTAGCGCTTTTCCCATGTCTCGC
TATGGACGACCTCTTTGCCCATGTCTGCTGAGGCGAGAAATGAAACTGGCATTTGCAACCAAGAAGGAGGAAAAAC
TGCTGCAGGTCTCGGAGGAATTAGTCATGGAGGCCAAGGCTGCTTTTGAGGATGCTCAGGAGGAAGCCAGAGCGG
AGAAGCTCCGAGAAGCACTTCCACCATTAGTGGCAGACAAAGGCATCGAGGCAGCCGAGAAAGTTGTCTGCGAAG
TGGAGGGGCTCCAGGCGGACATCGGAGCAGCATTAGTTGAAACCCCGCGCGGTACGTAAGGATAATACCTCAAG
CAAATGACCGTATGATCGGACAGTATATCGTTGTCTCGCCAAACTCTGTGCTGAAGAATGCCAAACTCGCACCAG
CGCACCCTGCTAGCAGATCAGGTTAAGATCATAACACACTCCGGAAGATCAGGAAGGTACGCGGTGCAACCATACG
ACGCTAAAGTACTGATGCCAGCAGGAGGTGCCGTACCATGGCCAGAAATTCCTAGCACTGAGTGAGAGCGCCACGT
TAGTGTAACGAAAGAGAGTTTGTGAACCGCAAACCTATACCACATTGCCATGCATGGCCCCGCCAAGAATACAG
AAGAGGAGCAGTACAAGGTTACAAAGGCAGAGCTTGCAAAACAGAGTACGTGTTTGACGTGGACAAGAAGCGTT
GCGTTAAGAAGGAAGAAGCCTCAGGTCTGTTCTCTCGGGAGAACTGACCAACCCTCCCTATCATGAGCTAGCTC
TGGAGGGACTGAAGACCCGACCTGCGGTCCCGTACAAGTGCAGAACTAGGAGTGATAGGACACACCGGGGTCCG
GCAAGTCAGCTATTATCAAGTCAACTGTACGGCAGAGATCTTGTACCAGCGGAAAGAAAGAAATTTGTCTCGC
AAATTGAGGCCGACGTGCTAAGACTGAGGGGTATGCAATTACGTGCAAGACAGTAGATTGCGTTATGCTCAACG
GATGCCACAAAGCCGTAGAAGTGCTGTACGTTGACGAAGCGTTGCGGTGCCACGCAGGAGCACTACTTGCCTTGA
TTGCTATCGTCAGGCCCCGCAAGAAGGTAGTACTATGCGGAGACCCCATGCAATGCGGATTCTTCAACATGATGC
AACTAAAGGTACATTTCAATCACCTGAAAAAGACATATGCACCAAGACATTCTACAAGTATATCTCCCGCGCTT
GCACACAGCCAGTTACAGCTATTGTATCGACACTGCATTACGATGGAAAGATGAAAACCACGAACCCGTGCAAGA
AGAACATTGAAATCGATATTACAGGGGCCACAAAGCCGAAGCCAGGGGATATCATCCTGACATGTTTCCGCGGGT
GGGTAAAGCAATTGCAAATCGACTATCCCGGACATGAAGTAATGACAGCCGCGGCCCTCACAAGGGCTAACCAGAA
AAGGAGTGTATGCCGTCCGGCAAAAAGTCAATGAAAACCCACTGTACGCGATCACATCAGAGCATGTGAACGTGT
TGCTCACCCGCACTGAGGACAGGCTAGTGTGGAACCTTGACGGGCGACCCATGGATTAAGCAGCTCACTAACA
TACCTAAAGGAACTTTTCAAGCTACTATAGAGGACTGGGAAGCTGAACACAAGGGAATAATTGCTGCAATAAACA
GCCCCACTCCCCGTGCCAATCCGTTGAGTGCAGACCAACGTTTGTGTTGGGCGAAAGCATTGGAACCGATACTAG
CCACGGCCGGTATCGTACTTACCGGTTGCCAGTGGAGCGAACTGTTCCACAGTTTGCGGATGACAAACCACATT
CGGCCATTTACGCCCTTAGACGTAATTTGCATTAAAGTTTTTCGGCATGGACTTGACAAGCGGACTGTTTTCTAAAC
AGAGCATCCCACTAACGTACCATCCCGCCGATTGAGCGAGGCGGTAGCTCATTGGGACAACAGCCAGGAACCC
GCAAGTATGGGTACGATCACGCCATTGCCGCCGAACCTCTCCGTAGATTTCCGGTGTTCAGCTAGCTGGGAAGG
GCACACAACCTGATTTGCAGACGGGGAGAACAGAGTTATCTCTGCACAGCATAACCTGGTCCCGGTGAACCCGA
ATCTTCTCAGCCTTAGTCCCCGAGTACAAGGAGAAGCAACCCGGCCCGGTGCAAAAATTTCTTGAACCAAGTTCA
AACACCACTCAGTACTTGTGGTATCAGAGGAAAAAATTGAAGCTCCCGTAAGAGAATCGAATGGATCGCCCCGA
TTGGCATAGCCGGTGCAGATAAGAACTACAACCTGGCTTTCCGGTTTCCGCCGAGGCACGGTACGACCTGGTGT
TCATCAACATTGGAACATAATACAGAAACCACCTTTGAGCAGTGCAGAACCATGCGGCGACCTTAAAAACCC
TTTCGCGTTCCGGCCCTGAATTGCCTTAACCCAGGAGGCACCTCGTGGTGAAGTCTATGGCTACGCCGACCGCA
ACAGTGAGGACGTAGTCACCGCTCTTGCCAGAAAGTTTGTGAGGGTGTCTGCAGCGAGACCAGATTGTGTCTCAA

FIG. 2C-1



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GCAATACAGAAATGTACCTGATTTTCCGACAACTAGACAACAGCCGTACACGGCAATTACCCCCGCACCATCTGA
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CGGATGTGCCTATGTCTTTTCGATCGTTTTCGACGGAGAGATTGATGAGCTGAGCCGAGAGTAAGTGAAGTCCG
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AGCGCAATGTCTGGAAGAAATTCATGCCCGGTGCTCGACACGTGCAAGAGGAACAACCTCAAACCTCAGGTACC
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GAAAATATGCATGTAATGACGAGTATTGGGAGGAGTTGCTCGGAAGCCAATTAGGATTACCACTGAGTTTGTCA
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GGCTTAAAACGTCCAGATGTGCAGCGTTCAATTGGCGAGCAACATCATACATGGAGTAGTATCTGACAAAGAAA
TGGCTGAGAGGTGCGCCACCTGGCTCAACATGGAGGTTAAGATCATCGACGCGAGTCATCGGTGAGAGACCCTT
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ttacacctgtcctactggcattgagaacttttgcccagagcaaaagagcattccaagccatcagaggggaaataa
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CATTACCTACACAGTGAACACCCCGAAGGATTCTATAACTGGCACACCGAGCGGTGAGTATAGTGGAGGTA
GATTTACCATCCCTCGCGGAGTAGGAGGCAGAGGAGACAGCGGTGCTCCGATCATGGATAACTCCGGTCgGGTTG

FIG. 2B-2



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TCGCGATAGTCCTCGGTGGAGCTGATGAAGGAACACGAACTGCCCTTTCGGTTCGTACCTGGAATAGTAAAGGGA
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tggtgccacataaccactatattaaccatttatctagcgagcgcaaaaaactcaatgtatttctgaggaagcgtg
gtgcataatgccacgcagcgtctgcataacttttattatttcttttattaatcaacaaaattttgtttttaacat
ttc

FIG. 2C-3



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Infection of human dendritic cells with a DC adapted alphavirus vector (DC+) expressing GFP

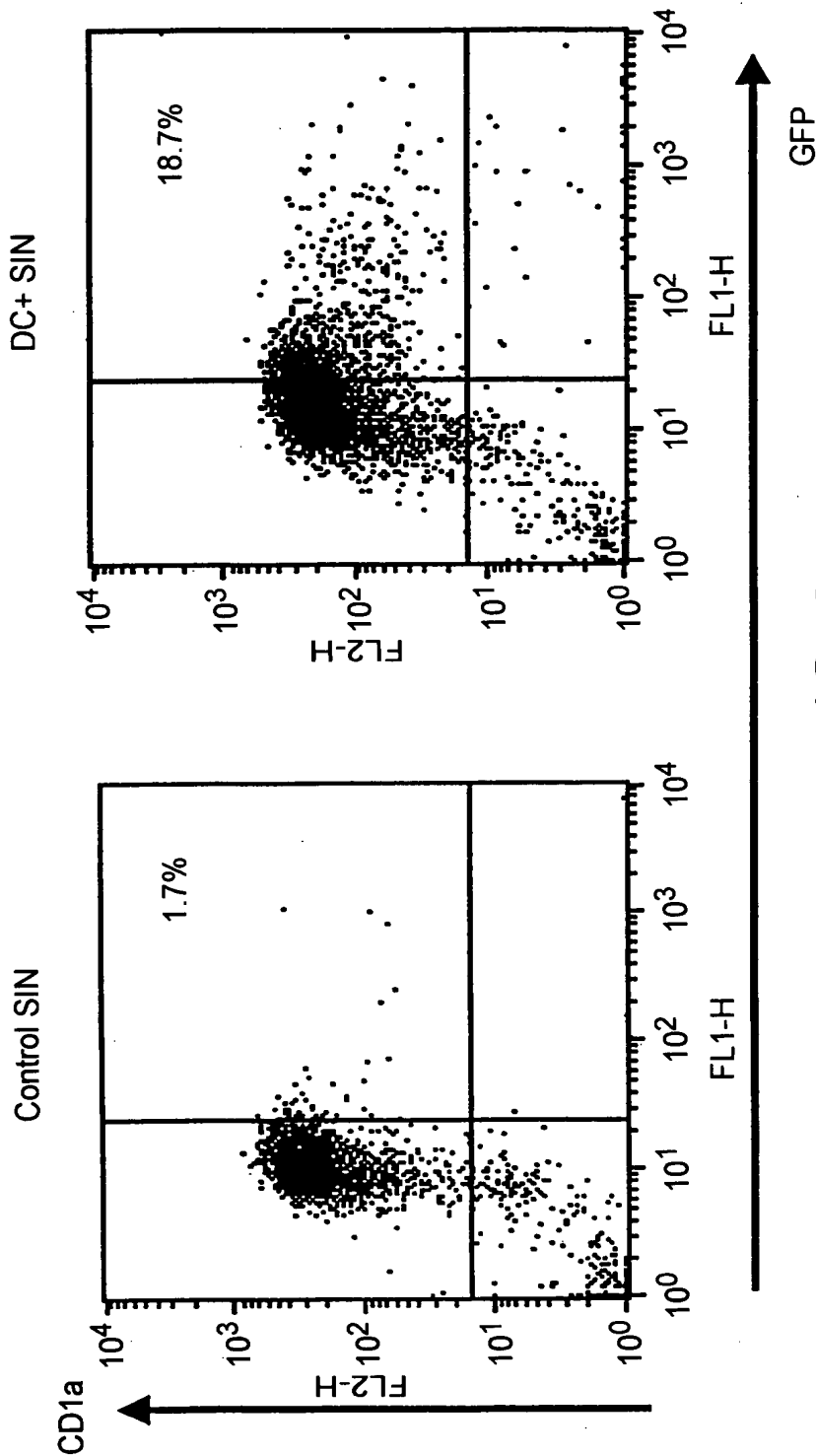
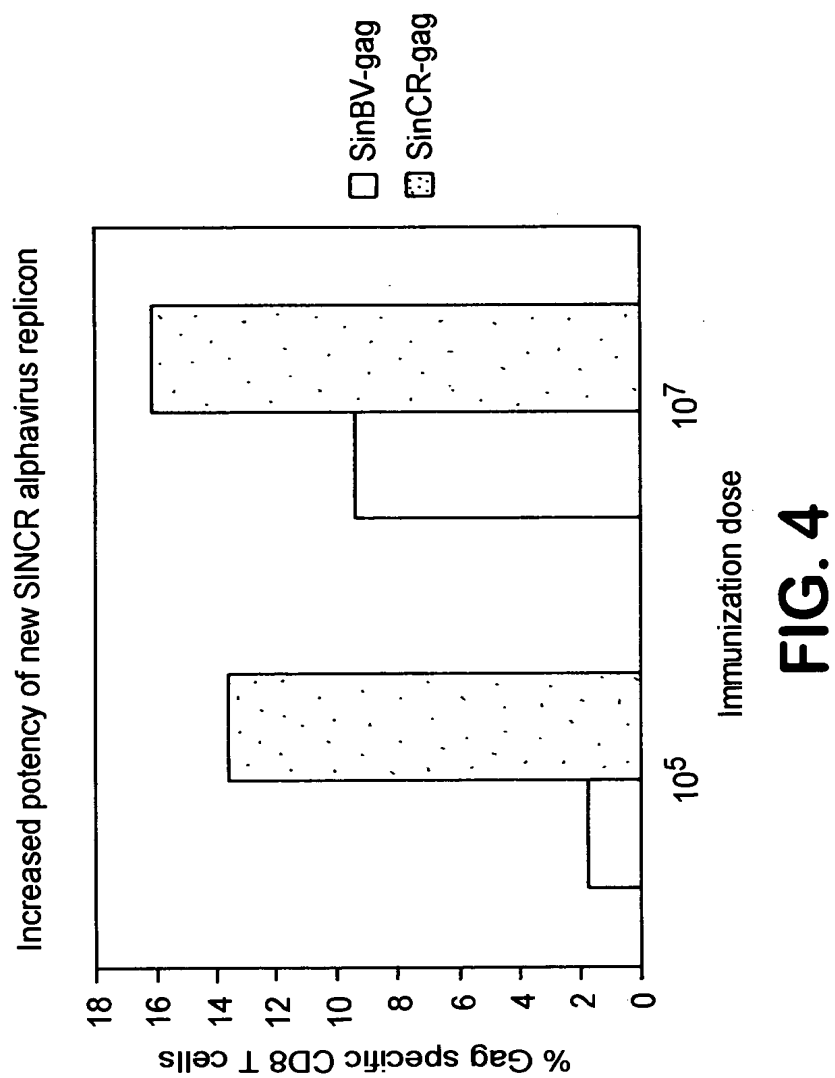


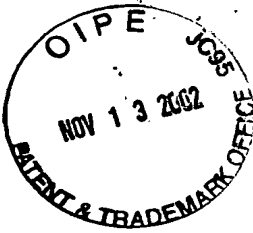
FIG. 3



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DC+ SIN vectors target immature human dendritic cells
immature → mature

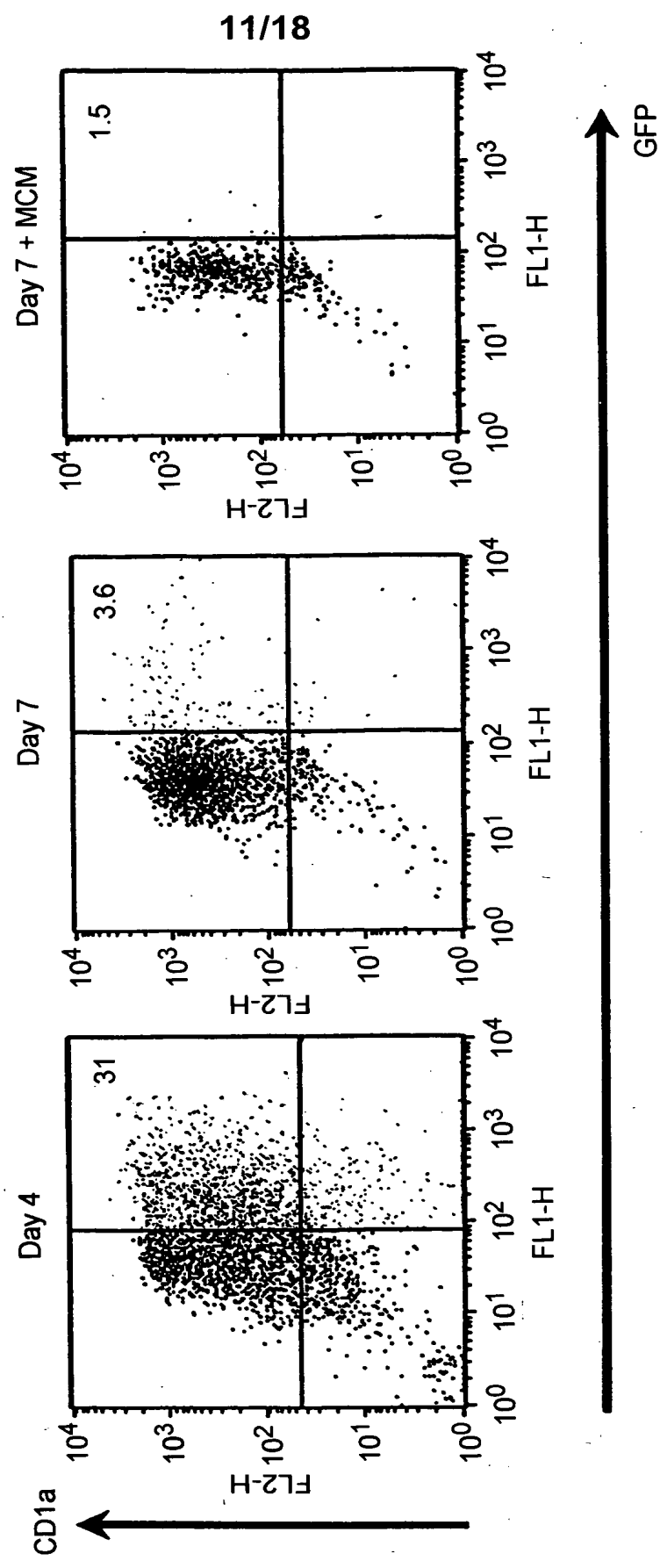
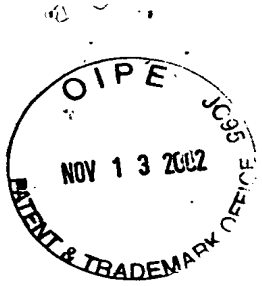


FIG. 5



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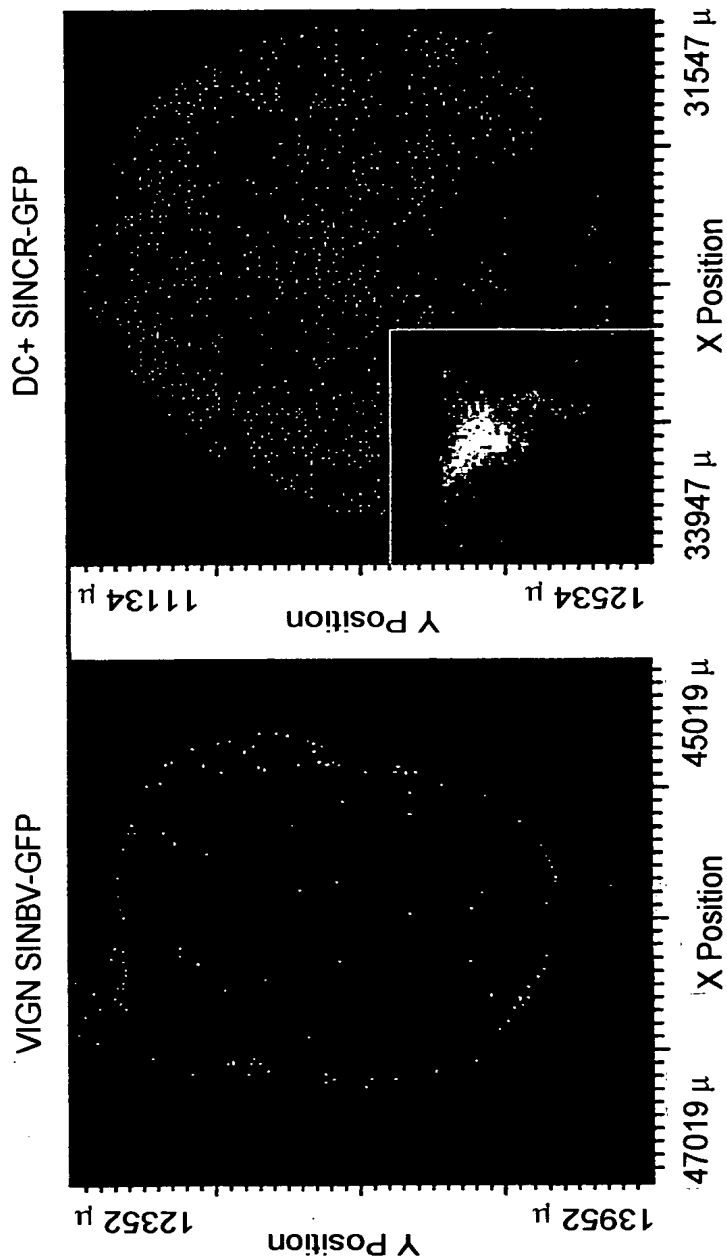


FIG. 6



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Trafficking of alphavirus vector transduced DC to the mandibular lymph node



x20

SIN-GFP vector injected intradermally, with rhodamine paint applied to skin

FIG. 7

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Mouse DC transduction is not predictive of the ability
of alphavirus vectors to transduce human DC

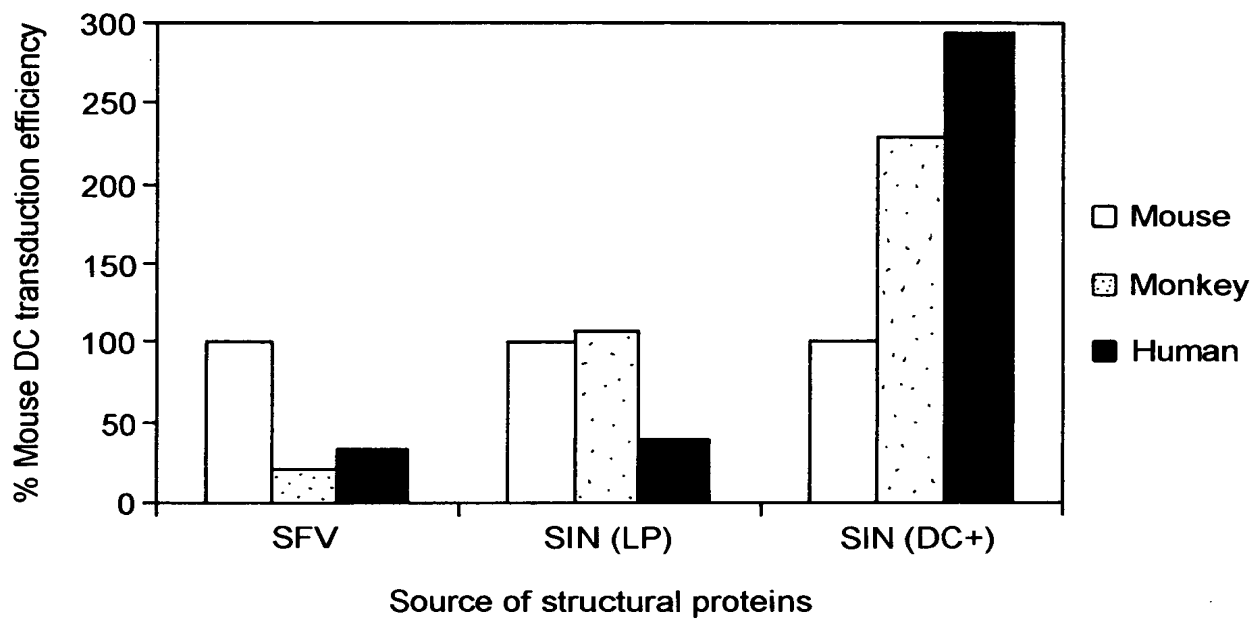


FIG. 8

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Polo et al.
COMPOSITIONS AND METHODS FOR
GENERATING AN IMMUNE RESPONSE
UTILIZING ALPHAVIRUS-BASED
VECTOR SYSTEMS
09/551,977

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Alphavirus vectors can induce DC maturation and activation both *in vitro* and *in vivo*

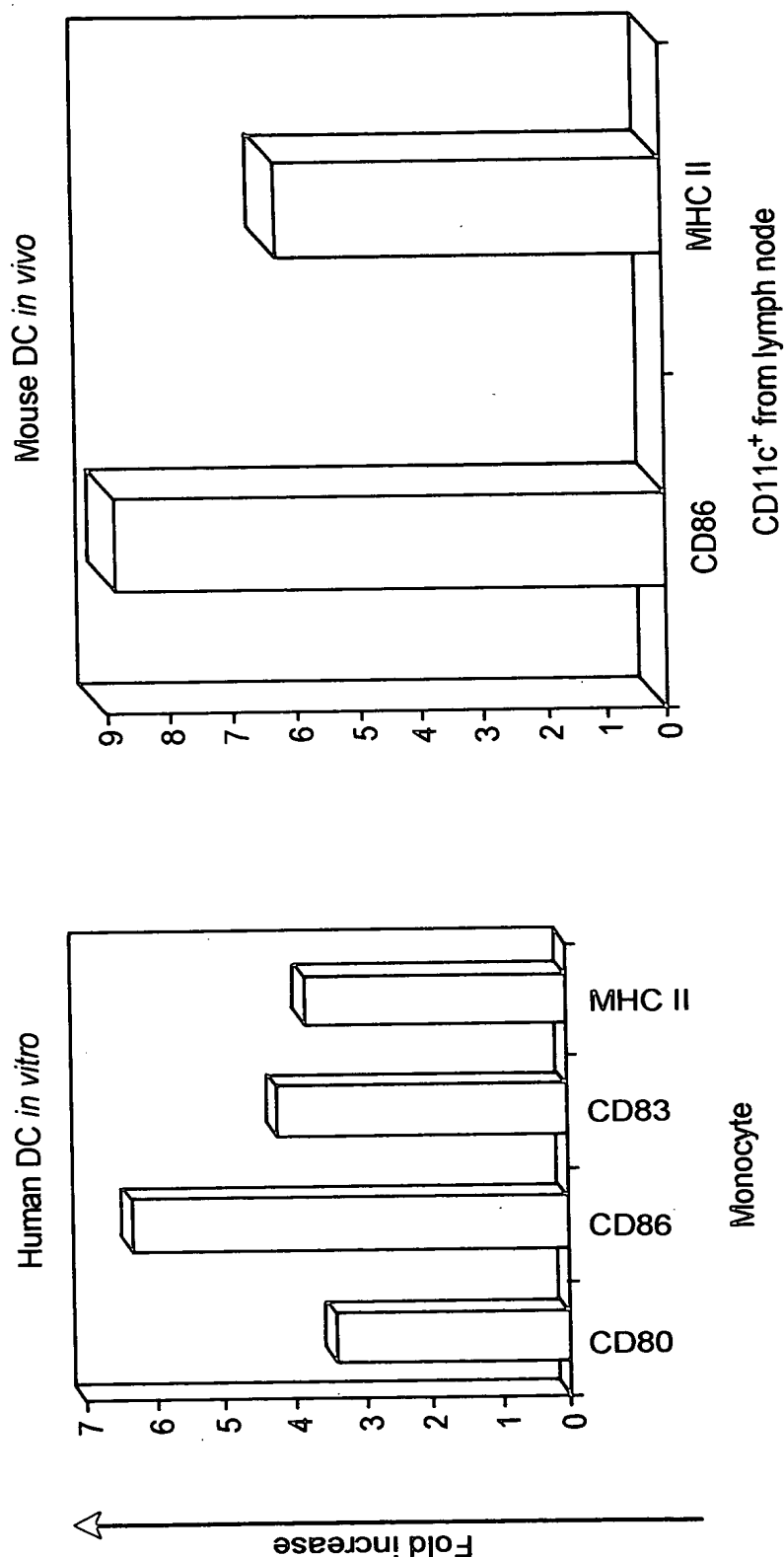


FIG. 9





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Adapted alphavirus vectors can be used to assay antigen presentation and immune stimulation in vitro

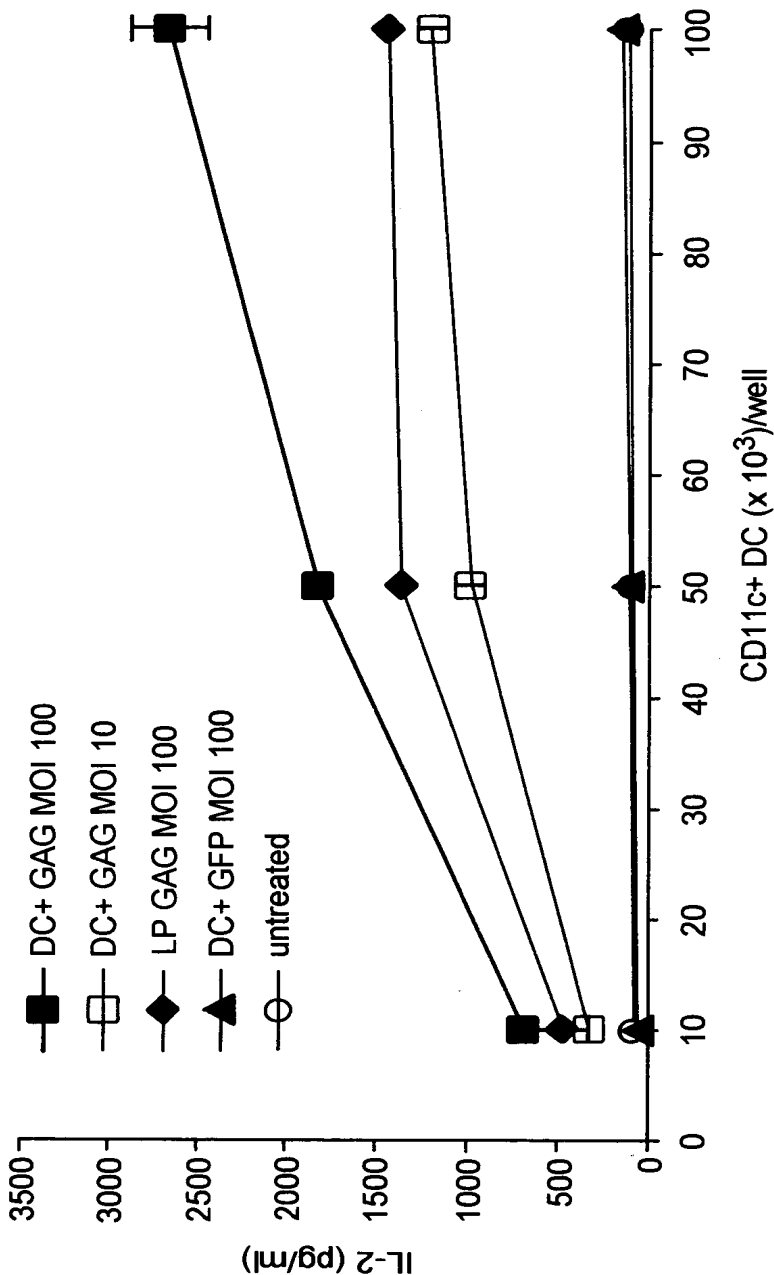


FIG. 10

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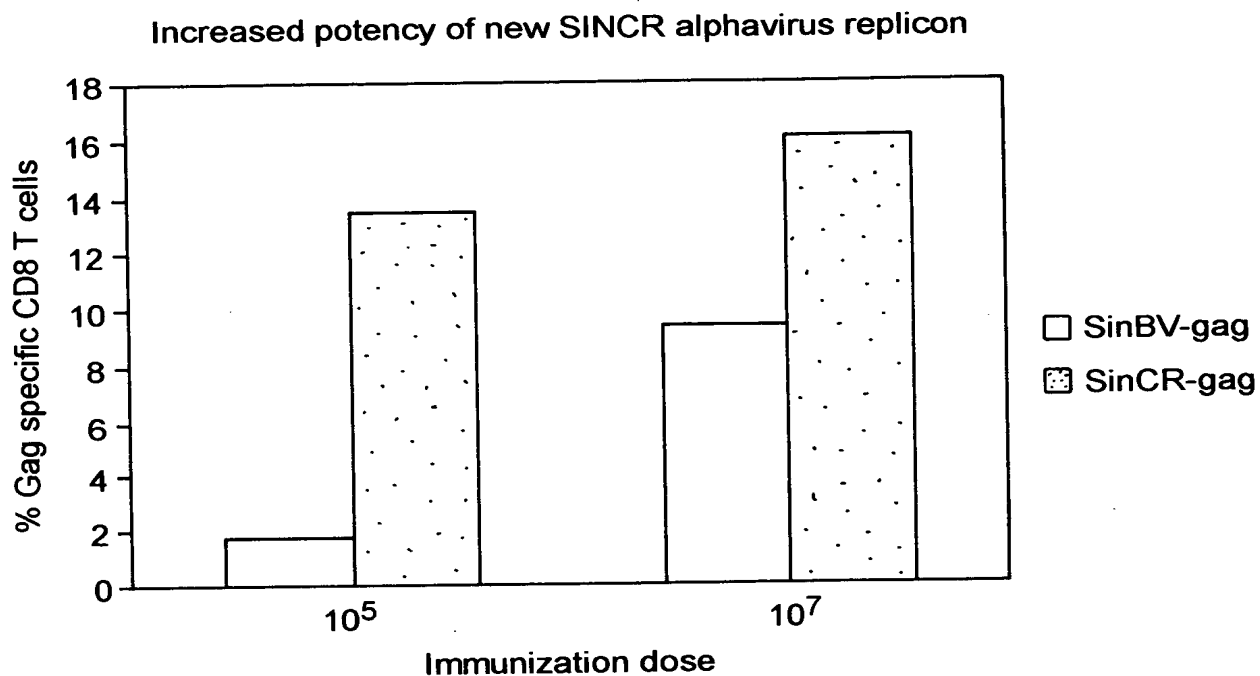
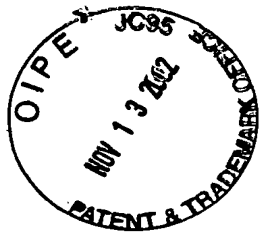


FIG. 11



Enhanced immune response by using a prime-boost strategy

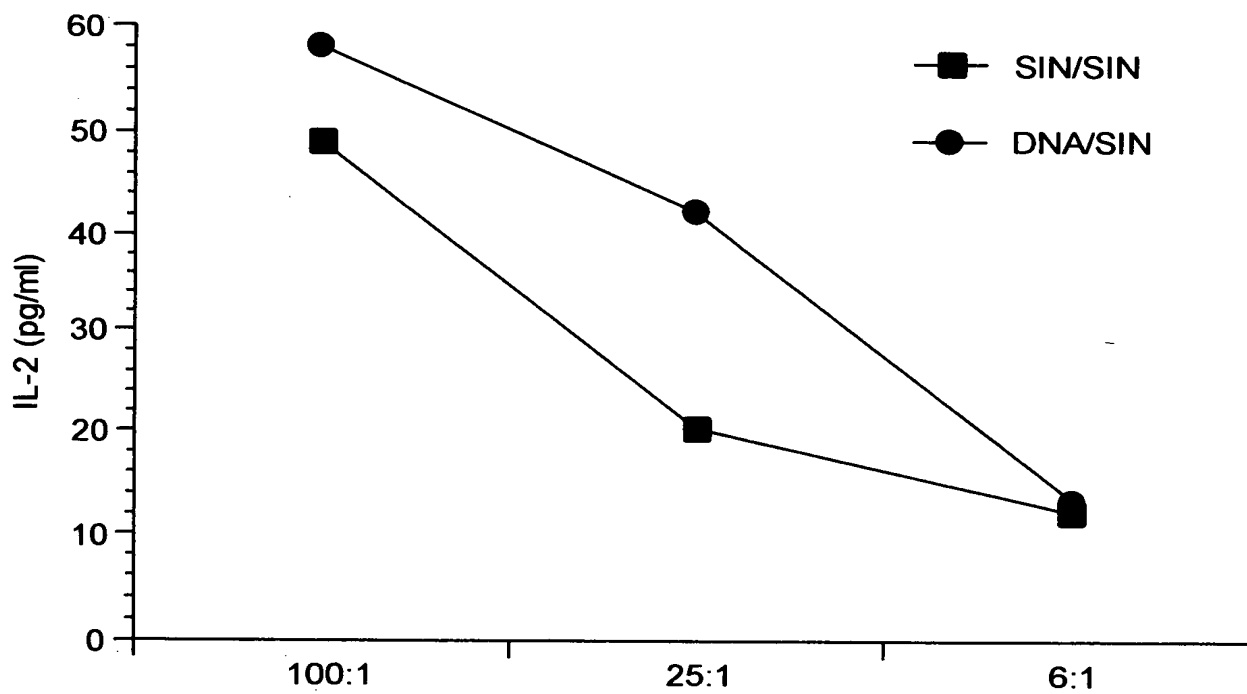


FIG. 12